

EEVC Status report

17th ESV conference Amsterdam, 4th to 7th June, 2001

It is my pleasure to present the status report of the European Enhanced Vehicle-safety Committee. We come to Amsterdam not only to present the work we achieved but also to listen to the efforts all participants of the ESV conference will report.

Biomechanics

The European test programme of Eurosid-2 is completed. EEVC has informed the regulatory bodies and the industry world wide on the intentions with respect to introduce E2-S in regulations. Also the co-ordination with Japan, Australia and USA was successful. Except for some small durability problems the testing was satisfactory. The flat top response for rib deflection seems not to be a problem anymore in most of the tests. In some of the tests the limit of thorax deflection was reached and a possible adjustment of the tolerance values should be considered. There exist at this time research activities for the development of a frontal impact dummy called FID and for a continuation of the SID 2000 project called SIBER. The results of these projects will be reviewed and assessed by EEVC. The working group is also engaged in the IHRA-Biomechanics work.

Side impacts

The development of an Interior Head-form Impact Test is still continuing in Phase III of the programme and several studies necessary for the Test are under way. Phase IV will comprise the validation of the proposed test procedure and this programme is currently being planned.

The test programme of MDB-to-car impacts has shown that an MDB face using the principle of a progressive stiffness throughout a single block works well. A draft for a revised specification for the MDB is already written. A validation phase is proposed to which will ensure that MDB faces produced by any manufacturer anywhere in the world to this specification will perform in the same way. The final proposal will be completed at the time of the conference. A progress report from this Working Group will be presented at this Conference.

The working group has also finalised a report for EC DG Enterprise regarding the Revision of the Side Impact Directive.

EEVC continues to join the IHRA side impact activities.

This IHRA WG seems to have made good progress in the two years that it has existed. There is a reasonable consensus about the content of the draft set of procedures which includes an MDB test, a pole impact test, some evaluation of Out-Of-Position performance for side airbags and an interior headform test.

The main issues to be resolved relate to the difference in traffic environment between North America and Europe/Asia, with high front SUVs being of some importance in North America, but less significant for Europe and Japan. The question of how far harmonisation can go with this difference is being actively discussed and has formed the basis for the development of supporting research programmes. MDB height and geometry seems to be the most significant parameters, followed by stiffness and then mass. Thus it may well be possible to harmonise on mass since this has a small effect. How far the other two factors can be treated as 'worst case' is now the main issue to be addressed. Other issues include the use of a rear seat dummy, the size of dummies to be used, and crabbled or non-crabbled MDB. Recent testing within EEVC programs has started to explore the use of a wider MDB face as an alternative to crabbing the barrier.

Truck Underrun

The EEVC is working to analyse accident figures for rear impact. The support of the EC to build a consortium for a European project is asked for, in order to continue the research for a deformable front underrun device.

Crash compatibility

EEVC has completed an extensive research project financed by the European Commission. In this project, an attempt was made to achieve a better understanding of the vehicle crash compatibility problem. Car-to-car compatibility involves minimising injury outcome by optimising the structural interaction between the colliding cars. The goal is to reduce the traffic injuries resulting from car-to-car accidents without decreasing the self protection of the cars involved. From the start of the research work it was clear that not all compatibility questions could be answered in a short term project.

The research work was partly funded by the Commission, and started in July 1997 for a period of two years. According to the contract the final

report should be presented to the Commission at the end of December 1999. The research consortium consisted of institutions from Germany, Sweden, Italy, France, Spain, The Netherlands, United Kingdom.

The research work concentrated on five working packages: Literature Review, Vehicle Structure Analysis, Accident Analysis, Crash Testing and Mathematical Modelling.

The main findings are:

- mass has the greatest effect
- as relevant factors influencing compatibility in frontal impact the following parameters were identified:
Good structural interaction, predictable performance of car structure in crashes, avoiding passenger compartment to collapse, control final stiffness of passenger compartment, manage deceleration injuries in the other vehicle at the same time, manage deceleration & time histories of both vehicles, future capabilities of restraint technology, not neglect limitations of restraint system of current fleet.
- a staged approach addressing each of the above items at a time is proposed.

For lateral impact the following were initial conclusions:

Geometry has the greatest effect while mass and stiffness have a lesser effect. Other important factors are vertical intrusion profile, designing side protection with current bullet car mix, dealing with self protection, promoting sill engagement, ensuring that the front structure of the bullet vehicle does not produce a thoracic lead, distributing loading of the occupant and only frontal stiffness distribution of the bullet vehicle (trolley) in the first say 100 mm of crush is important. Possible Assessment Methods for Compatibility could be:

Full width frontal impact with or without honeycomb, with force sensing, EEVC ODB with force sensing, bulkhead concept (peak force or 30 g), overload test (check compartment integrity), Renault ODB (varying stiffness over the width) to generate lateral shear, UTAC ODB (varying stiffness over the height) to look at vertical shear.

The research will be continued in follow-up projects.

EEVC also joins the IHRA activities on compatibility.

Advanced Offset Frontal Protection

The working group has finalised a report for EC DG Enterprise regarding the Revision of the Frontal Impact Directive. It is preparing separate reports on the Barrier Face and footwell intrusion.

The current European frontal impact deformable barrier face is of necessity a compromise design. However, it has proved successful at guiding car design to provide greater occupant protection. So far any attempts to improve its design have led to greater problems. For use in an ODB test, there is no pressing need to change the design. In future, changes to accommodate compatibility or if a MDB were to be considered, further research may be required to study the barrier face design.

On request of the EC EEVC has developed a frontal impact footwell intrusion measurement standard.

EEVC has continued its contribution to IHRA. There a two step approach is foreseen. A general agreement is found that the first step would include a full frontal test and an ODB test. For the second step a more open situation exist. The movable deformable barrier test proposed by NHTSA does not seem to be the way forward for Europe. The WG is looking at accident data to guide what measurements are needed for a future test.

Pedestrian Protection

As the culmination of many years of research, the EEVC Working Group – 17 completed its final report to the European Commission about proposed test methods for pedestrian protection and the scientific work which supports them. This reviewed the test methods already proposed by the EEVC in 1994 and recommended several important improvements to each test. It concluded that with these improvements, the package of test was, from a technical viewpoint, ready for use in a regulatory regime. Since then, the Commission has been considering these recommendations along with some alternative proposals from the European industry (ACEA) with a view to making an official proposal for implementation within the EU. The EEVC's role has been to provide technical advice to the Commission when requested.

In 2000 an alternative test method was proposed by ACEA, the joint European car manufacturers, based on the EEVC test methods. Later that year a third alternative has been proposed by the internal EC services. Finally the Joint Research Centre (JRC) of the EC in Ispra, Italy was requested by the EC/DG Enterprise to advise on the three alternative pedestrian protection test methods with respect to effectiveness and feasibility:

It should be stated here that EEVC is not a party in the discussions about the new EC directive on pedestrian protection. The EEVC provides scientific background information and advice.

A final decision on this topic is still pending.

EEVC is supporting the IHRA work on pedestrian protection. This working group is developing test procedures for the child head, adult head and leg, while the upper leg and other body parts were given a second priority. The current versions of the test procedures were mainly copied from the proposed ISO test procedures, which were originally based on the EEVC methods. An important extension in the IHRA procedure is the inclusion of the windscreen and A-pillar area, since many adult pedestrian heads are impacting that specific area.

Child safety

EEVC has created a new working group on child safety which will start at the end of this year.

IHRA / International Co-operation

The EEVC has taken part in the IHRA steering group. The critical self review of our committee came to the conclusion to recommend to continue these activities, in particular the work on side impact test procedures. The work on frontal impact protection should be merged with the compatibility work and the IHRA biomechanics work should be carefully restructured.

Outlook

We are determined to promote scientific research to improve the safety of cars. And we shall follow the presentations in the next few days with great interest. We also wish this year's ESV conference every success.

The work of our Governmental committee is described under the web-address:
<http://www.EEVC.org>